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ZOOLOGY.

Thélohan on Coccidia.¹—Thélohan describes a curious *Coccidium* (*C. cruciatum*) parasitic in the liver of *Caranx trachurus*. The four spores are arranged in the form of a cross and the envelope of each spore is formed by two valves, which is an entirely new departure for this genus. A *Coccidium* species (?) found in the livers of sardines and herrings was similar to *C. cruciatum* except that the cross arrangement of the spores was not noticed in any case. *C. minutum*, a new species from the tench, is also described.

It has been proven that the species of *Coccidium* which infest rabbits run through their spore stage after escaping from their hosts, but Thélohan has discovered the interesting fact that the new species which are here described, as well as *C. sardinae* Th. and *C. gasterostei* Th. form their spores and sporozoites while still inside their host. With this change of habit the thick membrane of other species becomes unnecessary and in the species found in fish the membrane is in reality very thin. *C. bigeminum* of dogs lies between these two extremes, for the sporoblasts form while the parasite is still in the dog, but the sporozoites evidently do not form until the parasites escape from their host.

In the same publication Thélohan describes "Des Sporozaires Indéterminés Parasites des Poissons (pp. 162-170)," which are very difficult to classify in the present system. They resemble *Eimeria*, but according to Thélohan the cyst contains a true nucleus as well as sporozoites.

It will be remembered that certain German authors now wish to suppress *Eimeria*, since they believe that genus simply forms a stage in the development of *Coccidium* by "gymnospores (Pfeiffer)." Should this theory be definitely established (contrary to Pfeiffer and others, we cannot consider it *as yet* definitely proven that *Eimeria* is identical with the gymnospor stage of *C. oviformes*), the "Sporozoaires indéterminés" of Thélohan might bear the same relation to the fish coccidia that *Eimeria*, according to certain German authors, bears to the coccidia found in rabbits.—C. W. S.

Recent Work on Parasites.—Dr. C. W. Stiles, of the Bureau of Animal Industry, has recently published several articles on para-

¹P. Thélohan, sur Quelques Coccidies Nouvelles Parasites des Poissons. Jour. de l'Anat. et de la Physiol., 1892, pp. 152-171, Plate 12, 1-32.

sites which may be of interest to the readers of THE NATURALIST, as most of the articles are upon American species.

Under the title *Bau und Entwicklungsgeschichte von Pentastomum Proboscideum* R. und *P. Subcylindricum* Dies (Z. f. w. Z., 1891, lii, pp. 85-157. Taf. vii-viii, Figs. 1-49), he gives an account of the microscopical anatomy and histology of the American *Pentastomum* (more correctly *Porocephalus*) *proboscideum*, found in the lungs of American snakes. He succeeded in infecting white mice with the embryos, and in this way raised *P. subcylindricum*, which had been supposed to be a separate species. The paper covers an historical review, synonymy, list of hosts; ten snakes for the adult form, ten mammals for the larva; geographical distribution, structure of the embryo; description of five stages in the development; bibliography of the order Linguatula.

It is impossible to enter into a detailed account of the results in this short review; suffice it to say that in the embryo he has found a well-developed nervous system, intestine, etc.; he denies that the boring apparatus of the embryo consists of rudimentary mouth-parts. In the first part of his paper he is evidently in doubt as to the homology of the four hooks found in the adult, but from his later statements he evidently believes them to be homologous with the mouth-parts rather than with the third and fourth pairs of legs of other arachnoids, as is now the generally accepted view (Claus).

Sur la Biologie des Linguatules (Compt. Rend. d. l. Soc. d. Biol., Paris, 1891, pp. 348-353) is a discussion of the various theories in regard to the wanderings of Linguatula and *Porocephalus* (*Pentastomum*).

Under the title, Notes on Parasites, Stiles is publishing a series of short informal articles upon observations on various parasites. Each article is numbered according as it is finished.

1. Sur la dent des Embryons d'*Ascaris* (Bull. d. l. Soc. Zool. d. France, 1891, pp. 163-164) has already been reviewed in this journal.

2. *Jour. Comp. Med. and Vet. Arch.*, 1892, pp. 517-526, twelve figs., gives a fuller description and figures of the parasites. Stiles mentioned in his Note Préliminaire sur Quelques Parasites (Bull. d. l. Soc. Zool. d. France, 1891, pp. 163-165), *Coccidium bigeminum*, a new species of sporozoa found in the intestinal villi of dogs; *Dispharagus gasterostei*, Stiles, 1891, the only member of the genus as yet found in fish; *Mermis crassa* v. L., which the author found escaping from larvæ of *Chironomus plumosus*.

3. On the intermediate host of *Echinorhynchus gigas* in America (Zool. Anzeiger) has been reviewed in THE NATURALIST.

4. *Myzomymus scutatus* (Müller) Stiles, 1892. (*Jour. Comp. Med. and Vet. Archiv.*, pp. 65-67, Fig. 1). In this article, which is a preliminary note on a species originally placed by Müller in another genus, the author describes a very common parasite infesting the oesophagus of American cattle. In No. 12 a complete description with figures is given.

5. A word in regard to the *Filaridæ* found in the body cavity of horses and cattle. (*Jour. of Comp. Med. and Vet. Archiv.*, 1892, pp. 143-146, Fig. 1). The author gives new diagnosis for the two species; describes four new sense papillæ on the head and a fifth pair of post-anal papillæ in *F. cervina*; introduces the term ad-anal to denote the fourth pair of pre-anal papillæ in this species of other authors; shows that the dorsal and ventral oral spines in the female of *F. cervina* are distinctly paired, while in the male of *Cervina* the pairing is indistinct; in both male and female of *F. equina* they are generally single, although occasionally a slight pairing was noticed.

6. On the presence of *Strongylus ostertagi* (Ostertag, 1890) Stiles, 1892, in America (*Jour. Comp. Med. and Vet. Archiv.*, 1892, pp. 147-148). The author mentions that the parasite, found in the rumen of cattle and sheep and known by German authors under the name of *Strongylus convolutus*, is found in this country. The specific name being preoccupied in the genus *Strongylus* Stiles, changes the name to *Ostertagi*.

7. A word in regard to Dr. Francis' *Distomum texanicum* (*Am. Vet. Rev.*, 1892, pp. 732-733). The author states that *Distomum texanicum* is identical with *Fasciola carnosa* seu *F. Americana* Hassall, '91, and probably identical with *D. magnum* Bassi, 1875.

8. A check list of the animal parasites of cattle (*Jour. of Comp. Med. and Vet. Archiv.*, 1892, pp. 346-350). The author gives a list of parasites found up to date in cattle.

9. Two cases of *Echinococcus multilocularis* in cattle (*Jour. Comp. Med. and Vet. Archiv.*, 1892, p. 350). The first case of *Echinococcus multilocularis* in this country in cattle is here recorded.

10. A case of intestinal coccidiosis in sheep (*The Jour. of Comp. Med. and Vet. Archiv.*, 1892, pp. 319-328, Figs. 1-14). The author describes and figures a case of *Coccidium perforans* in sheep found by Dr. Cooper Curtice. He discusses at length the new nomenclature of Sporozoa used by Wolters and Pfeiffer, and comes to the conclusion that it is not only very inappropriate but illogical and unzoological. He compares in a tabulated form the various stages of development with the corresponding stages of lower plants. The last column of

the table contains the technical terms which are most appropriate and which should be accepted.

11. *Distoma magnum* Bassi, 1875 (*Jour. of Comp. Med. and Vet. Archiv.*, 1892, pp. 464-466). Author states that he has compared specimens of *D. texanicum* Francis, *Fasciola americana* Hassall, and *Distomum magnum* Bassi, and finds them to be the same species. In a postscript he replies to a personal attack by Dr. Francis.

12. On the anatomy of *Myzomimus scutatus* (Mueller, '69) Stiles 1892 (Leuckart's Festschrift, 10 pp., with 1 plate, 29 figures). Minute description of microscopical anatomy of *Myzomimus scutatus*, found in the horse, cattle, sheep, and pig. The description of the embryo and its mode of progression is especially interesting.

13. *Tænia giardi* (Riv.) Moniez. (Bull. Soc. de. Biol., Paris, 1892, pp. 664-665). Some authors have described the genital pores as being double in this species. Whilst this is sometimes the case, the author shows that it is comparatively rare. The testicles are usually grouped on the side of the segment, but occasionally stray testicles are found in the median field. It is not infrequent to find fully developed female genital organs on one side of the segment and rudimentary ones on the other.

14. Sur le *Tænia expansa* Rudolphi. (Comp. Rend. d. l. Soc. d. Biol., 1892, No. 27, pp. 664-666).

Author describes a new organ that he has found in nearly all species of Moniezia he has examined. This organ which he calls the *interproglottidal gland*, is situated at the border between every two segments. In specimens of the type of *Moniezia planissima* n. sp., St. and H., this organ is linear in form, extending nearly from side to side. In the *Expansa* type these glands are found extending nearly across the whole of the segment but are not linear, a large number of glandular cells converging toward a blind sac, the sacs opening on the posterior border of the segment beneath the overlapping flap of the anterior segment.—ALBERT HASSALL, Washington, D. C.

New Fishes from Western Canada.—*Coregonus coulterii*, E. and G.—Types: Over one hundred specimens, Kicking Horse River, Field, B. C.

At an elevation of 4050 feet in the Rockies, just beyond the continental divide on the Canadian Pacific Railroad, I procured a species of *Coregonus*. *Coregonus williamsonii* is found about twenty-five miles to the east of Field at an elevation of 4500 feet in a tributary of the Saskatchewan. It is also found in the Columbia at an elevation

of 2550 feet at the mouth of the Kicking Horse, and again to the south in the headwaters of the Missouri. No specimens of *williamsoni* were noticed at Field, and the species obtained there is very different from *williamsonii*. The species found at Field is closely related to *C. kennebeci*, but has much larger scales.

Head, $4\frac{1}{2}$ -5; depth, $4\frac{1}{2}$ - $5\frac{1}{2}$; D., $10\frac{1}{2}$ - $11\frac{1}{2}$; S., 12-13; scales, 7-60 to 63-7. Form rather heavy, little elevated; the snout broad, very blunt and decurved; greatest depth of head equals its length less the opercle. Mouth low, the snout but little projecting, maxillary reaching eye in larger specimen, further in the smaller ones. Eye equals snout, 4-inch head; supplemental bone a crescent; gill rakers much as in *williamsoni*; scales large, dull silvery.

Named in honor of Rev. J. M. Coulter, author of the Manual of the Botany of the Rocky Mountain Region.

THE DARTERS OF CANADA.—Hitherto but a single species of *Etheostoma* has been known from British America. *E. boreale* was taken by Jordan at Montreal. Last summer I obtained several species in western Canada, which may be mentioned in advance of my general report on my summer's explorations.

2. *E. aspro* (Cope and Jordan). Winnipeg and Brandon.

3. *E. guntheri* E. and E. I procured three specimens of this species at Winnipeg. I have also discovered three specimens in the collections of the Indiana University taken by Prof. Meek near Cedar Rapids, Iowa.

Diagnosis.—Premaxillaries not protractile; gill membrane scarcely connected; ventral line with the median scales enlarged; lateral line complete; palate with well-developed teeth; preopercle entire; nape and breast (with the exception of the median line) naked; cheeks and opercles each with about three series of large scales. Head, $3\frac{4}{5}$; depth, $6\frac{1}{2}$; dorsal, 10-13 or 14; anal 2, $9\frac{1}{2}$ - $11\frac{1}{2}$; scales, 5-52 to 54-5. Closely related to *E. aspro*.

4. *E. nigrum* Rafinesque. Specimens of this species were taken at Westbourne in a tributary of Lake Winnipeg, in the Assiniboine at Brandon, and it was found to be quite abundant in the Cu'Appelle River at Fort Cu'Appelle. I was assured both at Brandon and at Cu'Appelle that this species was abundant in some streams further north.

5. *E. iowæ* Jordan and Meek. This species was abundant in the Swift Current at the station of the same name.

6. *E. quappella* E. and E., is known from a single specimen from Cu'Appelle, the northernmost point from which darters are as yet certainly known. It is related to *E. iowæ* and to *E. jessia*.

Diagnosis.—Premaxillaries not protractile; gill membrane scarcely connected; ventral line with the median scales not enlarged; lateral line straight, developed on 19 scales; palate without teeth; anal fin considerably smaller than soft dorsal; humeral region without black process; cheeks with a few scales just below and behind eye; opercle with a few scales on its upper angle. Head, 4; depth, $5\frac{1}{2}$; dorsal, IX-9; anal, 1, $6\frac{1}{2}$; scales, 3-53-7.

7. *Cottus philonips* E. and E., nom. sp. nov.

Cottus minutus Pallas, Zoogr. Rosso. Asiat. iii, 145, 1811-1831.

Uranidea microstomus Lockington. Proc. U. S. Nat. Mus., 1880, 58; not *Cottus microstomus* Heckel.

The only companion of *Coregonus coulterii* in the snow water of the Kicking Horse at Field, B. C., was a species of *Cottus*, of which seventeen specimens were obtained. These are probably to be referred to the description quoted above. This species seems to be an inhabitant of the cold waters of Alaska and to extend along the Rocky Mountains and the Sierras to Lake Tahoe, where it is replaced by *Cottus beldingii*. Specimens of the latter species are not now at hand, so that a direct comparison can not be made.

Head proportionately longer in the adult, about $4\frac{3}{4}$ -4 in head. D. VIII or IX-16 to 18; A. 11-13; V. 14. Pectoral reaching anal or past vent even in the largest specimens. Anus equi distant from tip of snout and base of caudal or nearer tip of snout. Ashy gray, with blackish blotches; no well defined cross bars except sometimes on the tail. Frequently a dusky blotch on anterior part of spinous dorsal and another near its posterior end; the fin sometimes wholly dusky, margined with white; pectorals soft, dorsal and caudal more or less barred.

5. *Cottus onychus* E. and E.

Type.—A single specimen 82 mm. long; Calgary.

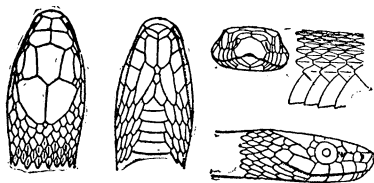
This species is evidently closely related to *C. pollicaris* J. and G., from which it differs chiefly in having many prickles.

Head, $3\frac{3}{4}$; depth, $6\frac{1}{2}$; D. VIII, 17; A., 13; V., I, 4; P., 13. Teeth on vomer, none on palatines. Width of head equals its length to end of preopercular spine, its depth 2 in its length. Preopercle with an upturned claw-like spine, below which are two others much smaller, the anterior one having its point turned downward and forward. Eye $1\frac{1}{3}$ in snout, $\frac{1}{2}$ in interorbital, $4\frac{1}{2}$ in head. Lower jaw projecting,

maxillary not reaching orbit. Sides above lateral line, which is complete, with stiff prickles from below the first dorsal spine to below the last ray; prickles below the lateral line more restricted. Dorsals connected by a low membrane, the soft rays much higher than the spines, 2 in head. Pectorals reaching past vent, the rays not branched. A median dusky spot on breast just behind anterior end of gill slits; ventral surface otherwise plain. Anal with a few dusky specks on its rays, other fins barred; sides and upper surfaces olive with darker spots. Three dark bands below soft dorsal; a narrow dark band just in front of the caudal.

A New Species of *Eutænia* from Western Pennsylvania.

—A collection of alcoholic specimens from near Franklin, Venango County, Pennsylvania, on the Alleghany River, sent me by Miss Anna M. Brown, contains the following species: *Bufo lentiginosus americanus*; *Rana virescens virescens*; *Plethodon glutinosus*; *Plethodon cinereus dorsalis*; *Ophibolus doliatus triangulus*; and a *Eutænia*, which appears to represent a specific form which I have not previously seen. The single specimen is small, but not young, and it belongs to the group of which *E. sirtalis* and *E. leptocephala* are members. It resembles both these species, but differs in important particulars. The labial plates are six above and eight below, instead of seven above and ten below. The head is not distinct from the neck, resembling in this respect the genus *Tropidoclonium*. The parietal scuta are convex in outline, and not contracted posteriorly. The headplates are otherwise as in those species; including oculars, $\frac{1}{2}$; temporals, $\frac{1}{2}$; and post-generals longer than pregenerals. Scales in nineteen series, all keeled



Eutænia brachystoma Cope $\frac{3}{8}$ Natural Size.

except the inferior row. Gastrosteges 132, anal 1, urosteges 72; color, below and upper lip light olive, unspotted; above darker olive, with a broad brown band on each side which extends from the fourth to the middle of the ninth row inclusive, leaving a pale dorsal stripe of ground color one and two half scales wide. Chin and anal plate yel-

lowish. No parietal pair of spots visible to the eye, but traces appear under a magnifier. Total length, 286 mm.; tail, 71 mm.

The reduction of the number of labial plates is effected both by the fusion of the fifth and sixth of the *E. sirtalis* and also by the abbreviation of the resulting plate, which, though longer than those adjacent to it, does not equal the two plates on the *E. sirtalis*, of which it is probably composed. The normality of the structure is confirmed by the reduction of the inferior labial series by two scales, all of which are of perfectly normal form. The gastrosteges are fewer in number than in any *E. sirtalis* or *E. leptcephala* known to me, while the number of urosteges remains as in those species. The absence of spots on the gastrosteges distinguishes it from most of the subspecies of *E. sirtalis*. The general form is that of *Tropidoclonium*, and the distinctness of the two nasal plates is the only feature which separates it from that genus. It is one of the forms of which several are now known, which, while retaining the general features of the water-snakes, have adopted a terrestrial life and more or less burrowing habits. I propose that this species be called *Eutænia brachystoma*.—E. D. COPE.

The Cervical Vertebrae of Monotremata.—In the number for January of THE AMERICAN NATURALIST, Prof. J. Baur mentions (p. 72) the fact that the cervical vertebrae of the existing Monotremata have no zygapophyses, and that neither Flower in his Osteology of Mammals, nor Flower and Lydekker in their Introduction to the Study of Mammals, notice this peculiarity.

May I be allowed to draw your attention to the descriptive catalogue of the Osteological Series contained in the Museum of the Royal College of Surgeons, Vol. i, 1853, where Prof. R. Owen states, on Ornithorhynchus, p. 215: "The cervical vertebrae, which are seven in number and have no zygapophyses, and on Echida, p. 218, not any of the cervical vertebrae have zygapophyses save the atlas."

Leipsic.

PROF. J. VICTOR CARUS.